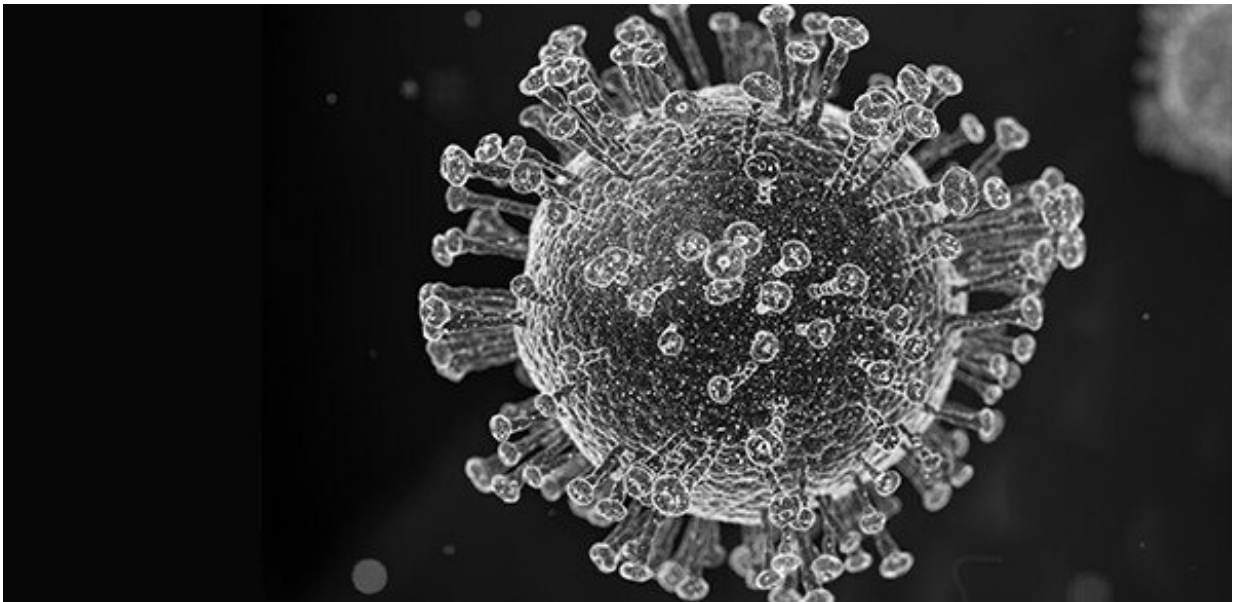# Striking differences revealed in COVID-19 mortality between NHS trusts

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Coronavirus. Credit: [Yuri Samoilov](#)

A University of Cambridge team led by Professor Mihaela van der Schaar and intensive care consultant Dr. Ari Ercole of the Cambridge Centre for AI in Medicine (CCAIM) is calling for urgent research into the striking differences in COVID-19 deaths they have discovered between the intensive care units of NHS trusts across England.

Using data science techniques, the team revealed that the NHS [trust](#) in

which a COVID-19 patient ended up in intensive care is as important, in terms of the risk of death, as the strongest patient-specific risk factors such as older age, immunosuppression or chronic heart/kidney disease. In the worst case, COVID-19 patients in the intensive care unit (ICU) of a particular NHS trust were over four times as likely to die in a given time period than COVID-19 patients in an average trust's ICU.

From the earliest days of the coronavirus pandemic, clinicians and scientists have been deciphering the risk factors that make someone with COVID-19 more likely to die. The uncovering of determinants of risk has allowed doctors to focus resources on the most vulnerable patients and has proved important in planning for the surge in demand for intensive care units created by the pandemic. It has also informed the public of which groups should take greater measures to shield or socially distance themselves. The new study is the first to reveal the extent to which ICU-patient location is a factor.

"COVID-19 has stretched most ICUs well beyond their normal capacity and necessitated them finding additional space, equipment and skilled staff—in an already stretched NHS—to deal with demand for highly specialist life-supporting therapies," says Dr. Ercole. "It is possible that some hospitals found this harder either because they didn't have time to react or the necessary resources. It is crucial to understand the reasons for these between-centre differences as we plan our response to similar situations in the future: how and where to build capacity, and how to use what we have most effectively."

The peer-reviewed paper—"Between-centre differences for COVID-19 ICU mortality from early data in England"—has been accepted for publication in *Intensive Care Medicine*.

The analysis was carried out on anonymised data from the COVID-19 Hospitalisation in England Surveillance System (CHESS) dataset,

supplied by Public Health England. The data were anonymised not only in terms of the patients but also in terms of the NHS trusts. The data covered 8 February to 22 May, during which there were 5062 ICU cases in 94 NHS trusts across England, with 1547 patient deaths and 1618 discharges from ICU.

The researchers call for urgent "comparative effectiveness research" to get to the bottom of these marked differences between NHS trusts. Knowledge gained in this direction could inform how ICUs are optimised and improve best practice in dealing with surges in COVID-19 cases in England, and perhaps beyond.

  More information: Zhaozhi Qian et al. Between-centre differences for COVID-19 ICU mortality from early data in England, (2020). DOI: 10.1101/2020.04.19.20070722

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